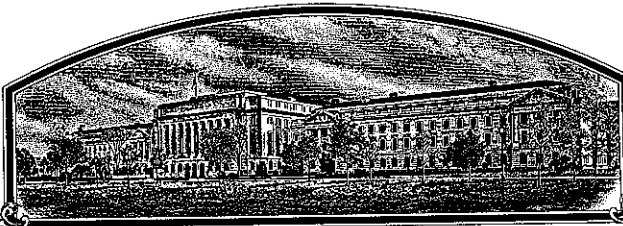


No.

9100192



THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME:

Asgrow Seed Company

Whereas, THERE HAS BEEN PRESENTED TO THE

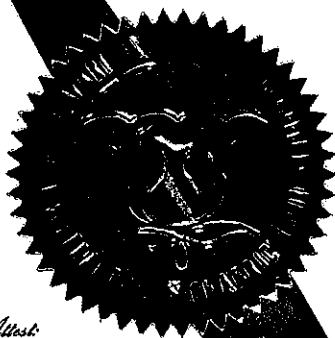
Secretary of Agriculture

AN APPLICATION REQUESTING A CERTIFICATE OF PROTECTION FOR AN ALLEGED NOVEL VARIETY OF SEXUALLY REPRODUCED PLANT, THE NAME AND DESCRIPTION OF WHICH ARE CONTAINED IN THE APPLICATION AND EXHIBITS, A COPY OF WHICH IS HEREUNTO ANNEXED AND MADE A PART HEREOF, AND THE VARIOUS REQUIREMENTS OF LAW IN SUCH CASES MADE AND PROVIDED HAVE BEEN COMPLIED WITH, AND THE TITLE THERETO IS, FROM THE RECORDS OF THE PLANT VARIETY PROTECTION OFFICE, IN THE APPLICANT(S) INDICATED IN THE SAID COPY, AND WHEREAS, UPON DUE EXAMINATION MADE, THE SAID APPLICANT(S) IS (ARE) ADJUDGED TO BE ENTITLED TO A CERTIFICATE OF PLANT VARIETY PROTECTION UNDER THE LAW.

NOW, THEREFORE, THIS CERTIFICATE OF PLANT VARIETY PROTECTION IS TO GRANT UNTO THE SAID APPLICANT(S) AND THE SUCCESSORS, HEIRS OR ASSIGNS OF THE SAID APPLICANT(S) FOR THE TERM OF *eighteen* YEARS FROM THE DATE OF THIS GRANT, SUBJECT TO THE PAYMENT OF THE REQUIRED FEES AND PERIODIC REPLENISHMENT OF VIABLE BASIC SEED OF THE VARIETY IN A PUBLIC REPOSITORY AS PROVIDED BY LAW, THE RIGHT TO EXCLUDE OTHERS FROM SELLING THE VARIETY, OR OFFERING IT FOR SALE, OR REPRODUCING IT, IMPORTING IT, OR EXPORTING IT, OR USING IT IN PRODUCING A HYBRID OR DIFFERENT VARIETY THEREFROM, TO THE EXTENT PROVIDED BY THE PLANT VARIETY PROTECTION ACT (STAT. 1542, AS AMENDED, 7 U.S.C. 2321 ET SEQ.)

SOYBEAN

'A1662'



In Testimony Whereof, I have hereunto set my hand and caused the seal of the Plant Variety Protection Office to be affixed at the City of Washington, D.C. this 30th day of October in the year of our Lord one thousand nine hundred and ninety-two.

Attest:

Kenneth H. ...
Commissioner
Plant Variety Protection Office
Agricultural Marketing Service

Edward Madigan
Secretary of Agriculture

U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE

APPLICATION FOR PLANT VARIETY PROTECTION CERTIFICATE

(Instructions on reverse)

Application is required in order to determine if a plant variety protection certificate is to be issued (7 U.S.C. 2421). Information is held confidential until certificate is issued (7 U.S.C. 2426).

1 NAME OF APPLICANT(S) (as it is to appear on the Certificate) Asgrow Seed Company		2 TEMPORARY DESIGNATION OR EXPERIMENTAL NO XP1662	3 VARIETY NAME A1662
4 ADDRESS (street and no. or RFD no., city, state, and ZIP) 9646-190-20 7000 Portage Road Kalamazoo, MI 49001		5 PHONE (include area code) (616) 385-6649	FOR OFFICIAL USE ONLY PVPO NUMBER 9100192 Date May 31, 1991 Time <input type="checkbox"/> A.M. <input type="checkbox"/> P.M. Filing and Examination Fee \$ 2150. ⁰⁰ Date May 24, 1991 Certificate Fee \$ 250. ⁰⁰ Date Sept. 1, 1992
6 GENUS AND SPECIES NAME Glycine Max	7 FAMILY NAME (Botanical) Leguminosae		
8 CROP KIND NAME (Common Name) Soybean	9 DATE OF DETERMINATION September, 1985		Filing and Examination Fee \$ 2150. ⁰⁰ Date May 24, 1991 Certificate Fee \$ 250. ⁰⁰ Date Sept. 1, 1992
10 IF THE APPLICANT NAMED IS NOT A "PERSON" GIVE FORM OF ORGANIZATION (Corporation, partnership, association, etc.) Corporation			
11 IF INCORPORATED, GIVE STATE OF INCORPORATION Delaware	12 DATE OF INCORPORATION March 22, 1968		Filing and Examination Fee \$ 2150. ⁰⁰ Date May 24, 1991 Certificate Fee \$ 250. ⁰⁰ Date Sept. 1, 1992
13 NAME AND ADDRESS OF APPLICANT REPRESENTATIVE(S), IF ANY, TO SERVE IN THIS APPLICATION AND RECEIVE ALL PAPERS Mr. Gary E. Starwalt 9646-190-20 Asgrow Seed Company 7000 Portage Road, Kalamazoo, MI 49001			

PHONE (include area code) (616) 385-6649

14 CHECK APPROPRIATE BOX FOR EACH ATTACHMENT SUBMITTED (Follow INSTRUCTIONS on reverse)

a ☒ Exhibit A. Origin and Breeding History of the Variety

b ☒ Exhibit B. Novelty Statement

c ☒ Exhibit C. Objective Description of Variety

d ☒ Exhibit D. Additional Description of Variety

e ☒ Exhibit E. Statement of the Basis of Applicant's Ownership

f ☒ Seed Sample (2,500 viable untreated seeds) Date Seed Sample mailed to Plant Variety Protection Office _____

g ☒ Filing and Examination Fee (\$2,150) made payable to "Treasurer of the United States"

15 DOES THE APPLICANT(S) SPECIFY THAT SEED OF THIS VARIETY BE SOLD BY VARIETY NAME ONLY AS A CLASS OF CERTIFIED SEED? (See section 83(a) of the Plant Variety Protection Act.)

☐ YES (If "YES" answer items 16 and 17 below) ☒ NO (If "NO" skip to item 18 below)

16 DOES THE APPLICANT(S) SPECIFY THAT THIS VARIETY BE LIMITED AS TO NUMBER OF GENERATIONS?

☐ YES ☒ NO

17 IF "YES" TO ITEM 16, WHICH CLASSES OF PRODUCTION BEYOND BREEDER SEED?

☐ FOUNDATION ☐ REGISTERED ☐ CERTIFIED

18 DID THE APPLICANT(S) PREVIOUSLY FILE FOR PROTECTION OF THE VARIETY IN THE U.S.?

☐ YES (If "YES" through ☐ Plant Variety Protection Act ☐ Patent Act Give date _____) ☒ NO

19 HAS THE VARIETY BEEN RELEASED, USED, OFFERED FOR SALE, OR MARKETING IN THE U.S. OR OTHER COUNTRIES?

☐ YES (If "YES," give names of countries and dates) ☒ NO

20 The applicant(s) declares that a viable sample of basic seeds of this variety will be furnished with the application and will be replenished upon request in accordance with such regulations as may be applicable.

The undersigned applicant(s) is (are) the owner(s) of this sexually reproduced novel plant variety, and believes that the variety is distinct, uniform, and stable as required in section 41, and is entitled to protection under the provisions of section 42 of the Plant Variety Protection Act.

Applicant(s) is (are) informed that false representation herein can jeopardize protection and result in penalties.

SIGNATURE OF APPLICANT (Owner(s)) Gary E. Starwalt	CAPACITY OR TITLE Agronomic Business Development	DATE May 20, 1991
SIGNATURE OF APPLICANT (Owner(s))	CAPACITY OR TITLE	DATE

Asgrow Seed Company
PVP Application A1662 Soybean
April, 1991

EXHIBIT A

ORIGIN AND BREEDING HISTORY OF A1662

- 1983 Cross was made in 1983.
Parentage: A3127 * (Century 84/2/*AP6)
- 1983-84 F₁ and F₂ generation grown at Isabela, Puerto Rico
(Winter)
- 1984 F₃ generation grown at Redwood Falls, Minnesota. Two-hundred plants selected from a bulk population and threshed individually.
- 1985 Progeny row GH831626 A85-11206 was selected for its uniformity in plant height and standability. This row was harvested in bulk and seeds were checked and verified for uniform seed coat luster and hilum color.
- 1986 GH831626 A85-11206 was entered in the preliminary P148 yield test conducted at two locations at Stewart and Redwood Falls, Minnesota.
- 1987 GH831626 A85-11206 was entered into the advanced V150 yield test conducted at 13 locations in 4 states.

Three hundred F₆ plants were selected and threshed individually, and then screened for resistance to Phytophthora root rot in January, 1988; 192 sublines were found to be homozygous resistant to race 1.
- 1988 GH831626 A85-11206 was entered into the advanced V100 yield test conducted at 8 locations in 3 states.

GH831626 A85-11206 was selected for its yield, standability, and disease resistance and was assigned the maturity designation X1662.

One hundred ninety-two pure rows were grown and X1662-123 was selected as homozygous resistant for pod wall color and resistance to Phytophthora root rot.

It was in September, 1988 that X1662-123, a F₆ derived line was determined to be a stable and unique line.
- 1989 X1662 was entered into the advanced V100 yield trial at 7 locations in 3 states. X1662 was nominated to XP1662 and seed increased.

A 20-entry sub-line yield test was conducted at 3 locations in 3 states. X1662-123 was selected and bulked as breeders seed.
- 1989-90 Ten pounds of X1662-123 went through a 2-cycle increase at Isabela,
(winter) Puerto Rico.

EXHIBIT A

ORIGIN AND BREEDING HISTORY OF Al662 - Continued

1990 XPl662 was entered into the advanced V100 yield trial grown at 7 locations in 3 states.

XPl662 was tested for Phytophthora root rot resistance in April, 1990 and found to be resistant to races 1-5, 7-11, 13, 17 and 21.

Foundation seed of XPl662 was produced near Perry, Iowa.

XPl662 was nominated for release and assigned the designation Al662.

Al662 is uniform and stable within commercially acceptable limits based on trial observations since Xl662-123 was identified in 1988. As with other soybean varieties, variants can occur for almost any characteristic during the course of repeated sexual reproduction.

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Asgrow Seed Company
PVP Application Al662 Soybean
April, 1991

EXHIBIT B

NOVELTY STATEMENT CONCERNING Al662 SOYBEAN

To our knowledge the soybean varieties that most closely resemble Al662 are Kato, A2543, Kenwood, A2234 and A2872. Characteristics which differentiate Al662 include:

1. Pod Wall Color:
 - Al662 = Brown
 - Kato = Brown
 - A2543 = Tan *
 - Kenwood = Brown
 - A2234 = Tan *
 - A2872 = Brown
2. Peroxidase Activity:
 - Al662 = Low
 - Kato = High *
 - A2543 = High *
 - Kenwood = Low
 - A2234 = Low
 - A2872 = High *
3. Reaction to Races of Phytophthora megasperma f. sp. glycinea:

	Race																	
	1	2	3	4	5	7	8	9	10	11	12	13	16	17	19	20	21	25
Al662	R	R	R	R	R	R	R	R	R	R	S	R	S	R	S	S	R	S
Kato *	R	R	S	S	S	S	S	S	R	R	R	R	S	R	R	R	R	S
A2543	R	R	R	R	R	R	R	R	R	R	S	R	S	R	S	S	R	S
Kenwood *	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S
A2234	R	R	R	R	R	R	R	R	R	R	S	R	S	R	S	S	R	S
A2872	R	R	R	R	R	R	R	R	R	R	S	R	S	R	S	S	R	S

4. Relative Maturity (RM)

		1991 Yield Trial		
		University of Minnesota		Iowa State University
	RM	Central	North	Central
Al662	16	9-11	9-11	
Kato	16	9-11		
A2543	25			9-11
Kenwood	23		9-21	
A2234	22		9-16	
A2872	28			9-20

U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE
LIVESTOCK, MEAT, GRAIN & SEED DIVISION
PLANT VARIETY PROTECTION OFFICE
BELTSVILLE, MARYLAND 20705

EXHIBIT C
(Soybean)

OBJECTIVE DESCRIPTION OF VARIETY
SOYBEAN (*Glycine max* L.)

NAME OF APPLICANT(S) Asgrow Seed Company	TEMPORARY DESIGNATION XP1662	VARIETY NAME A1662
ADDRESS (Street and No., or R.F.D. No., City, State, and Zip Code) 9638-190-23 Gull Road, Building 190 Kalamazoo, MI 49001		FOR OFFICIAL USE ONLY PVPO NUMBER 9100192

Choose the appropriate response which characterizes the variety in the features described below. When the number of significant digits in your answer is fewer than the number of boxes provided, place a zero in the first box when number is 9 or less (e.g.,). Starred characters ★ are considered fundamental to an adequate soybean variety description. Other characters should be described when information is available.

1. SEED SHAPE:



1 = Spherical (L/W, L/T, and T/W ratios = < 1.2)
3 = Elongate (L/T ratio > 1.2; T/W = < 1.2)

2 = Spherical Flattened (L/W ratio > 1.2; L/T ratio = < 1.2)
4 = Elongate Flattened (L/T ratio > 1.2; T/W > 1.2)

★ 2. SEED COAT COLOR: (Mature Seed)

1 = Yellow 2 = Green 3 = Brown 4 = Black 5 = Other (Specify) _____

3. SEED COAT LUSTER: (Mature Hand Shelled Seed)

1 = Dull ('Corsoy 79'; 'Braxton') 2 = Shiny ('Nebsoy'; 'Gasoy 17')

★ 4. SEED SIZE: (Mature Seed)

Grams per 100 seeds

★ 5. HILUM COLOR: (Mature Seed)

1 = Buff 2 = Yellow 3 = Brown 4 = Gray 5 = Imperfect Black 6 = Black 7 = Other (Specify) _____

★ 6. COTYLEDON COLOR: (Mature Seed)

1 = Yellow 2 = Green

★ 7. SEED PROTEIN PEROXIDASE ACTIVITY:

1 = Low 2 = High

★ 8. SEED PROTEIN ELECTROPHORETIC BAND:

1 = Type A (SP1^a) 2 = Type B (SP1^b)

★ 9. HYPOCOTYL COLOR:

1 = Green only ('Evans'; 'Davis') 2 = Green with bronze band below cotyledons ('Woodworth'; 'Tracy')
3 = Light Purple below cotyledons ('Beeson'; 'Pickett 71')
4 = Dark Purple extending to unifoliate leaves ('Hodgson'; 'Coker Hampton 266A')

★ 10. LEAFLET SHAPE:

1 = Lanceolate 2 = Oval 3 = Ovate 4 = Other (Specify) _____

11. LEAFLET SIZE:

☐ 21 = Small ('Amsoy 71'; 'A5312')
3 = Large ('Crawford'; 'Tracy')

2 = Medium ('Corsoy 79'; 'Gasoy 17')

12. LEAF COLOR:

☐ 31 = Light Green ('Weber'; 'York')
3 = Dark Green ('Gnome'; 'Tracy')

2 = Medium Green ('Corsoy 79'; 'Braxton')

★ 13. FLOWER COLOR:

☐ 2

1 = White

2 = Purple

3 = White with purple throat

★ 14. POD COLOR:

☐ 2

1 = Tan

2 = Brown

3 = Black

★ 15. PLANT PUBESCENCE COLOR:

☐ 2

1 = Gray

2 = Brown (Tawny)

16. PLANT TYPES:

☐ 31 = Slender ('Essex'; 'Amsoy 71')
3 = Bushy ('Gnome'; 'Govan')

2 = Intermediate ('Amcor'; 'Braxton')

★ 17. PLANT HABIT:

☐ 3

1 = Determinate ('Gnome'; 'Braxton')

2 = Semi-Determinate ('Will')

3 = Indeterminate ('Nebsoy'; 'Improved Pelican')

★ 18. MATURITY GROUP:

☐ 0 ☐ 4

1 = 000

2 = 00

3 = 0

4 = I

5 = II

6 = III

7 = IV

8 = V

9 = VI

10 = VII

11 = VIII

12 = IX

13 = X

★ 19. DISEASE REACTION: (Enter 0 = Not Tested; 1 = Susceptible; 2 = Resistant)

BACTERIAL DISEASES:

★

☐ 0Bacterial Pustule (*Xanthomonas phaseoli* var. *sojensis*)

★

☐ 0Bacterial Blight (*Pseudomonas glycinea*)

★

☐ 0Wildfire (*Pseudomonas tabaci*)

FUNGAL DISEASES:

★

☐ 0Brown Spot (*Septoria glycines*)Frogeye Leaf Spot (*Cercospora sojina*)

★

☐ 0

Race 1

☐

Race 2

☐

Race 3

☐

Race 4

☐

Race 5

☐

Other (Specify)

☐ 0Target Spot (*Corynespora cassicola*)☐ 1Downy Mildew (*Peronospora trifoliorum* var. *manshurica*)☐ 2Powdery Mildew (*Microsphaera diffusa*)

★

☐ 1Brown Stem Rot (*Cephalosporium gregatum*)☐ 0Stem Canker (*Diaporthe phaseolorum* var. *caulivora*)

19. DISEASE REACTION: (Enter 0 = Not Tested; 1 = Susceptible; 2 = Resistant) (Continued)

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FUNGAL DISEASES: (Continued)

- ★ ☐ 0 Pod and Stem Blight (*Diaporthe phaseolorum* var. *sojae*)
- ☐ 0 Purple Seed Stain (*Cercospora kikuchii*)
- ☐ 0 Rhizoctonia Root Rot (*Rhizoctonia solani*)
- Phytophthora Rot (*Phytophthora megasperma* var. *sojae*)
- ★ ☐ 2 Race 1 ☐ 2 Race 2 ☐ 2 Race 3 ☐ 2 Race 4 ☐ 2 Race 5 ☐ 0 Race 6 ☐ 2 Race 7
- ☐ 2 Race 8 ☐ 2 Race 9 ☐ 2 Other (Specify) Resistant to Race 10, 11, 13, 17, 21

VIRAL DISEASES:

- ☐ 0 Bud Blight (Tobacco Ringspot Virus)
- ☐ 0 Yellow Mosaic (Bean Yellow Mosaic Virus)
- ★ ☐ 0 Cowpea Mosaic (Cowpea Chlorotic Virus)
- ☐ 0 Pod Mottle (Bean Pod Mottle Virus)
- ★ ☐ 0 Seed Mottle (Soybean Mosaic Virus)

NEMATODE DISEASES:

- Soybean Cyst Nematode (*Heterodera glycines*)
- ★ ☐ 0 Race 1 ☐ 0 Race 2 ☐ 1 Race 3 ☐ 1 Race 4 ☐ 0 Other (Specify) _____
- ☐ 0 Lance Nematode (*Hoplolaimus Colombus*)
- ★ ☐ 0 Southern Root Knot Nematode (*Meloidogyne incognita*)
- ★ ☐ 0 Northern Root Knot Nematode (*Meloidogyne Hapla*)
- ☐ 0 Peanut Root Knot Nematode (*Meloidogyne arenaria*)
- ☐ 0 Reniform Nematode (*Rotylenchulus reniformis*)
- ☐ OTHER DISEASE NOT ON FORM (Specify): _____

20. PHYSIOLOGICAL RESPONSES: (Enter 0 = Not Tested; 1 = Susceptible; 2 = Resistant)

- ★ ☐ 1 Iron Chlorosis on Calcareous Soil
- ☐ Other (Specify) _____

21. INSECT REACTION: (Enter 0 = Not Tested; 1 = Susceptible; 2 = Resistant)

- ☐ 0 Mexican Bean Beetle (*Epilachna varivestis*)
- ☐ 0 Potato Leaf Hopper (*Empoasca fabae*)
- ☐ Other (Specify) _____

22. INDICATE WHICH VARIETY MOST CLOSELY RESEMBLES THAT SUBMITTED.

CHARACTER	NAME OF VARIETY	CHARACTER	NAME OF VARIETY
Plant Shape	A2543	Seed Coat Luster	A2543
Leaf Shape	A2543	Seed Size	A2543
Leaf Color	A2543	Seed Shape	A2543
Leaf Size	A2543	Seedling Pigmentation	A2543

23. GIVE DATA FOR SUBMITTED AND SIMILAR STANDARD VARIETY: Paired Comparison Data

VARIETY	NO. OF DAYS MATURITY	PLANT LODGING SCORE	CM PLANT HEIGHT	LEAFLET SIZE		SEED CONTENT		SEED SIZE G/100 SEEDS	NO. SEEDS/ POD
				CM Width	CM Length	% Protein	% Oil		
A1662 Submitted	123	1.2	86	8.6	13.3	42.5	21.5	18.5	2.6
A2543 Name of Similar Variety	131	1.4	80	8.9	13.4	42.9	21.2	18.0	2.6

PUBLICATIONS USEFUL AS REFERENCE AIDS FOR COMPLETING THIS FORM:

1. Caldwell, B.E., ed. 1973. Soybeans: Improvement, Production, and Uses. Amer. Soc. Agron. Monograph No. 16.
2. Buttery, B.R. and R.I. Buzzell. 1968. Peroxidase activity in seeds of soybean varieties. Crop Sci., 8: 722-725.
3. Hymowitz, T. 1973. Electrophoretic analysis of SBTi-A₂ in the USDA soybean germplasm collection. Crop Sci., 13: 420-421.
4. Payne, R.C. and L.F. Morris. 1976. Differentiation of soybean cultivars by seedling pigmentation patterns. J. Seed Technol. 1: 1-19.

Asgrow Seed Company
PVP Application A1662 Soybean
April, 1991

EXHIBIT D

ADDITIONAL DESCRIPTION OF THE VARIETY

A1662 is a mid-maturity group 1 cultivar that possesses an outstanding combination of characters needed by producers in its maturity zone. It combines high yield potential, excellent standability, very good hypocotyl elongation (emergence) score, above average protein, and resistance to many races of phytophthora megasperma f. sp. glycinea conferred by the Rps_1^k alleles.

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Asgrow Seed Company
PVP Application A1662 Soybean
April, 1991

EXHIBIT E

STATEMENT OF BASIS OF APPLICANT OWNERSHIP

A1662 was originated and developed by Roger L. Lussenden, an Asgrow Plant Breeder. By agreement between Asgrow Seed Company, all rights to any invention, discovery, or development made by employees are assigned to the company. No rights of such invention, discovery, or development are retained by the employee.